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In the Matter of

Federal-State Joint Board
on Universal Service

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To the Joint Board:

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JOINT COMMENTS OF
NATIONAL SCHOOL BOARDS ASSOCIATION, AMERICAN LIBRARY
ASSOCIATION, INCLUDING THE AMERICAN ASSOCIATION OF SCHOOL
LIBRARIANS, A DIVISION OF ALA, NATIONAL EDUCATION ASSOCIATION,
CONSORTIUM FOR SCHOOL NETWORKING, COUNCIL OF CHIEF STATE SCHOOL
OFFICERS, EDUCATION LEGISLATIVE SERVICES, INC.,
NATIONAL ASSOCIATION OF INDEPENDENT SCHOOLS, NATIONAL
ASSOCIATION OF SECONDARY SCHOOL PRINCIPALS, AMERICAN FEDERATION
OF TEACHERS, AFL-CIO, ASSOCIATION FOR THE ADVANCEMENT OF
COMPUTING IN EDUCATION, NATIONAL ASSOCIATION OF ELEMENTARY
SCHOOL PRINCIPALS, AMERICAN ASSOCIATION OF SCHOOL
ADMINISTRATORS, AMERICAN PSYCHOLOGICAL ASSOCIATION,
ASSOCIATION FOR SUPERVISION AND CURRICULUM DEVELOPMENT,
COUNCIL FOR AMERICAN PRIVATE EDUCATION,
COUNCIL FOR EDUCATIONAL DEVELOPMENT AND RESEARCH,
EDUCATIONAL TESTING SERVICE,
GLOBAL VILLAGE SCHOOLS INSTITUTE,
NATIONAL ASSOCIATION OF STATE BOARDS
OF EDUCATION, NATIONAL PARENTS AND TEACHERS ASSOCIATION,
NATIONAL RURAL EDUCATION ASSOCIATION,
TECHNOLOGY AND INNOVATIONS IN EDUCATION,
TRIANGLE COALITION FOR SCIENCE AND TECHNOLOGY EDUCATION,
AND UNITED STATES DISTANCE LEARNING ASSOCIATION

Summary

The joint commenters described in Appendix A, representing the interests of public and private schools and libraries, urge the Federal-State Joint Board to recommend that the Commission adopt rules fully and aggressively implementing the

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universal service provisions of the Telecommunications Act of 1996 (the "1996 Act"). In adopting the 1996 Act, Congress acknowledged the importance of education to the future economic development of the nation. It is no longer enough to ensure the availability of residential telephone service. Today's globally competitive economy requires that all schools and libraries have access to modern telecommunications technology at affordable rates for two reasons. First, telecommunications technology can improve the quality, efficiency, and responsiveness of the educational system. Second, the effective use of advanced telecommunications technology is already an essential employment skill.

In adopting the 1996 Act, Congress recognized that the current telecommunications infrastructure in schools and libraries is inadequate. Only 9% of classrooms are connected to the Internet, and many schools and libraries continue to have no access at all. In addition, unless the needed services are affordable, they might as well not be available. Many schools and libraries do not provide their students and patrons with adequate access because they cannot afford the connections they need to perform their functions properly. Ensuring affordability is also critical to ensure that services are available on an equitable basis across the country.

The 1996 Act provides that core residential services must be available to all -- including schools and libraries -- at "just, reasonable and affordable" rates. In addition, certain special services must be provided to schools and libraries at affordable rates. The 1996 Act does not define "special services," but to meet the

statutory goals, the Commission should define special services broadly to include all the services necessary to ensure that schools and libraries have the ability to take advantage of all the benefits of advanced telecommunications for educational purposes.

Therefore, special services should include, at a minimum, local and long distance transmission services to provide two-way voice and data communication throughout the world, access to information services throughout the world, and additional services covered by Section 254(h). Such "covered services" include (i) unbundled broadband switching and transmission capacity capable of delivering high quality video; and (ii) classroom and library access, including high-speed, broadband circuits to the building "demarcation" point, and inside wiring to all classrooms, offices, libraries, and computer work stations.

Schools and libraries need, not particular technologies or technical solutions, but the ability to perform certain functions. The best approach will depend on what is practical and cost-effective in a given situation. For this reason, and to impose economic discipline on users, the Commission should include a full range of service options up to and including the highest level described above.

The 1996 Act does not specify how the discount for special services is to be calculated. The legislative history gives the Commission considerable flexibility in this regard. We propose a method that is based on the competitive market price or a surrogate for the market price for each service (if no such market price is readily ascertainable), and then provides for a discount from the competitive market price to

a level that will ensure affordability to the large majority of schools and libraries. We further propose to allow the carrier, at such time as sufficient data is available, to establish a floor for the rate for a particular special service at the Total Service Long Run Incremental Cost of providing that service. Finally, to further ensure that the goals of the legislation are met, we also propose an additional lifeline subsidy to schools and libraries in very poor areas.

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Introduction

The joint commenters, representing public and private schools and libraries, urge the Federal-State Joint Board to recommend that the Commission adopt rules fully and aggressively implementing the full intent of the universal service provisions of the Telecommunications Act of 1996 (the "1996 Act"). We are encouraged by the breadth of the Commission's Notice of Proposed Rulemaking and Order Establishing the Joint Board (the "NPRM") initiating this proceeding, and we urge the Commission to establish a standard of service to schools and libraries that will provide the full benefit of advanced telecommunications at the most affordable price.

I. IN ADOPTING THE TELECOMMUNICATIONS ACT OF 1996, CONGRESS ACKNOWLEDGED THE IMPORTANCE OF EDUCATION TO THE FUTURE ECONOMIC DEVELOPMENT OF THE NATION.

New Section 254 of the Communications Act of 1934 goes beyond merely reaffirming the traditional role of universal service as a means of ensuring that all Americans enjoy the benefits of telecommunications technology, to call for a substantial expansion of that concept. The 1996 Act recognizes that it is no longer enough to ensure the availability of residential telephone service: The demands of today's global, competitive economy require that all schools and libraries have access to advanced telecommunications technology at affordable rates. As advanced technology spreads around the world, the key to future economic success is access to information and the skills needed to transform information into useful knowledge. And for the nation as a whole to succeed, the opportunity to acquire those skills must be available to all Americans. By enhancing the role of universal service, the 1996

Act reaffirms the value and importance of education and increases opportunities for life-long learning.

II. MODERN TELECOMMUNICATIONS TECHNOLOGY IS ESSENTIAL TO A MODERN EDUCATIONAL SYSTEM.

The Conference Report accompanying the 1996 Act makes plain the importance of advanced telecommunications to our educational system:

New subsection (h) of section 254 is intended to ensure that . . . elementary and secondary school classrooms, and libraries have affordable access to modern telecommunications services that will enable them to provide . . . educational services to all parts of the Nation.

The availability of K-12 classrooms, [and] libraries . . . to obtain access to advanced telecommunications services is critical to ensuring that these services are available on a universal basis. . . . This universal access will assure that no one is barred from benefiting from the power of the Information Age.¹

A. Telecommunications Technology Can Improve the Quality, Efficiency, and Responsiveness of the Educational System.

We agree with Congress's emphasis on improving access to telecommunications services. For example, different children respond to different instructional methods. Internet access in the classroom allows teachers to engage students in new ways by adding graphics and the ability to get information in depth when it is needed. This new dimension draws in students who learn better on their own or do not respond well to a lecture format. Modern telecommunications technology can also be used to assist in teacher, librarian and staff training, improve parent-teacher communications, increase the range of courses and resources available

¹ H. Rep. 104-458, 104th Cong. 2d Sess., at 132-33 (Jan. 31, 1996) ("Conf. Rpt.").

in the schools, and increase the range of information available to library patrons.

To supplement paragraph 72 of the NPRM, we wish to point out some specific examples of improvements achieved through the use of telecommunications technology:

- o Guilford County, North Carolina, has equipped all of its schools with interactive, broadcast-quality distance learning facilities, connected all of its classrooms with fiber optics, and installed an OC-3 fiber line to link its network to the public switched network. Attendance rates are up, discipline problems are down, and the County has reduced staff travel and the busing of students for special classes.²
- o In Union City, New Jersey, the introduction of computers and Internet access has led to marked improvement in the English language skills of the student body, 75% of whom do not speak English at home. The use of e-mail has encouraged students to develop their writing skills, the ease of on-line research has improved the quality of research projects, and standardized test scores have gone from well below the state average to above average. KickStart Report at 37.
- o The State of Maryland has developed "Sailor," a state-wide telecommunications infrastructure connecting public libraries across the state and allowing patrons remote access. Every Maryland resident can now reach the Internet and information about state and local events, affairs, and resources with a local phone call. KickStart Report at 52.
- o The Southeast Kansas Interactive Distance Learning Network operates a fiber optic network that can carry up to 16 channels of video simultaneously, and has been used to conduct an interactive town hall meeting with the area's Congressman by linking ten school sites. In addition to increasing the range of available courses, the network has been used for special programs such as video conferences between American and Russian students. See articles attached as Appendix C.

² United States Advisory Council on the National Information Infrastructure, KickStart Initiative, Connecting America's Communities to the Information Superhighway (January 1996) (the "KickStart Report"), at 36. A copy of the KickStart Report is attached as Appendix B. See also NSBA NII Awards Application (1995).

- o Beaver High School and three other Oklahoma schools have established an interactive distance learning network that is also being used for weekly teacher training sessions. NSBA telephone survey.
- o Approximately 200 public libraries now maintain World Wide Web sites, including the Alachua County Library District in Gainesville, Florida, the St. Charles City-County Library District in St. Peters, Missouri, and the Seattle Public Library in Seattle, Washington. By establishing Web sites, these libraries have extended their reach beyond their geographic boundaries and made their electronic holdings available to a new class of world-wide patrons.

While some of these examples require advanced technology and others do not, increased transmission capacity and more advanced technology increases the range of options and opportunities available to students, teachers, parents, librarians and library patrons. The additional examples listed in the discussion of what should be included in the definition of special services make this clear.

B. Proficiency with Advanced Telecommunications Is a Vital Employment Skill that Will only Grow in Importance.

The effective use of advanced telecommunications technology is already an essential employment skill, as important as the traditional "three R's." "As businesses lean more heavily on telecommunications and electronic technology, American workers must increasingly learn the ways of electronic communications just to carry out their day-to-day responsibilities."³ For example, in 1993, 47% of jobs required computer or networking capability.⁴ In 1984, that figure was only 25%. McKinsey

³ The Children's Partnership, America's Children and the Information Superhighway (Sep. 1994) ("America's Children") at 7.

⁴ McKinsey & Co., Connecting K-12 Schools to the Information Superhighway (1995) ("McKinsey Report") at 7.

Report at 7. One study has forecast that by the year 2000 60% of jobs will require computer and advanced telecommunications skills. Id. Just as important, such jobs will pay 10-15% more than jobs that do not require those skills. Id. These facts alone justify the introduction of advanced telecommunications services into all schools and libraries as quickly as possible.

Providing all schools and libraries with the ability to impart these skills is not a luxury. If those institutions are to perform their functions properly, they must have the necessary facilities, or we will all pay a price. For instance, American businesses are already losing \$25-30 billion a year through poor product quality, low productivity, and absenteeism attributable to the current lack of information literacy. America's Children at 7. Businesses spend additional sums training and retraining workers to the levels they need. Id. These expenses add to the price of products all Americans buy and make our products less competitive in the world market. In short, there is no doubt that proficiency with advanced telecommunications is already a critical job skill that must be distributed as widely as possible.

C. In Adopting the Snowe-Rockefeller-Exon-Kerrey Amendment, Congress Recognized that the Current Level of Technology Available in Most Schools and Libraries Is Inadequate, not just in Rural or High-Cost Areas, but across the Nation.

The above examples demonstrate what can be done, even in remote or low-income urban areas, by schools and libraries with access to the appropriate telecommunications technology. The vast majority, however, do not have access to the services necessary to provide similar opportunities in their communities. Furthermore, most of the examples involved substantial contributions from the private

sector. The reality is that even in affluent suburban schools the current level of technology is generally inadequate to provide students with the training and opportunities they need.

This inadequacy extends to all types of facilities and services, including transmission lines to the building, networks inside the building, terminal equipment, and information services. For example, as noted in the NPRM, only 9% of all instructional rooms (classrooms, media centers and computer labs) are currently on the Internet.⁵ In addition, many of the computers installed in schools could not connect to any internal or external network. McKinsey Report at 32. While 49% of schools have local area networks, half of those are used only for administrative purposes and less than 10% of school networks were used to connect computers in all classrooms. Id. at 33. Similarly, while nearly all schools have telephones, only 12% of classrooms have telephones -- and those rooms without telephones generally have no telephone lines. Id. In a report on school facilities, the General Accounting Office found that over half of all schools reported "insufficient capability in modems, phone lines for modems, phone lines for instruction, conduits/raceways, and fiber optics."⁶

For reasons we will discuss later, we are primarily concerned with the

⁵ U.S. Department of Education, National Center for Education Statistics, Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, 1995, E.D. TABS (Feb. 1996), an excerpt from which is attached as Appendix D.

⁶ General Accounting Office, School Facilities -- America's Schools not Designed or Equipped for 21st Century, B-259609 (Apr. 4, 1995) ("GAO Report").

improvement of external connections and internal networks. External connections are obviously critical, because they are the means for the delivery of information to and from the Internet and other sources. Schools face a problem familiar to anybody who has conducted on-line research from a home computer. As reported in the Wall Street Journal on December 27, 1995, it takes approximately 2.3 minutes to download a 2MB image over a typical residential 14.4 Kbps line. A more complex image requiring 16 MB would take 18.5 minutes, and a short video clip could take 1.4 hours. These are clearly not useful speeds. Even over a 56 Kbps line, a simple image takes 35.7 seconds. Few people -- and children least of all -- have the patience to sit in front of a computer terminal waiting for images to appear at such slow speeds. But fewer than 5% of schools have ISDN or T-1 connections; indeed, such connections may not be available at all to as many as one-third of all schools. McKinsey Report at 32-33. Thus, schools need dramatically improved transmission capacity.

Internal networks are equally important to the business of teaching and learning. All rooms in a school must be connected -- classrooms, libraries, labs and offices -- or even the best outside connections will be of little use. This allows for more spontaneity in the use of the technology, since it can then occur at any time during the school day and not just when a media center or lab is available, or during a weekly class visit to the library. For students to learn how to do research on-line and get the most out of that experience, they must have more than an occasional turn at the keyboard. And for parents, teachers and administrators to make the best use of e-mail and other services, all classrooms and offices must be connected to each

other and to the outside world.

Libraries also suffer from inadequate telecommunications capabilities. Some libraries have tried to meet the challenge of keeping up with technological changes by offering their patrons Internet access -- but most do not. Only 23.3% of public libraries offered direct access in 1995, although somewhat more allow patrons to access the Internet with the assistance of a staff member and over two-thirds have staff access. PLA/PLDS, Technology in Public Libraries 1995 Survey, Statistical Report 1995 Public Library Data Services (1995). But the vast majority of these libraries face the same access problems as schools; slow transmission speeds sharply reduce the utility of the technology they have. Libraries also need to increase their networking capacity to improve efficiency and make their resources available to more people.

Finally, unless the needed services are affordable, they might as well not be available. Many institutions have found that they cannot keep up with the demand for their services, but also cannot afford the connections that would meet that demand.⁷ Ensuring affordability is also critical to ensure that services are available on an equitable basis across the country. As non-profit institutions that provide vital public services, it is in the interest of all Americans that schools and libraries have affordable access to telecommunications at rates that will ensure that all parts of the

⁷ See Declaration of Craig Lyndes, attached as Appendix E ("Lyndes Decl."); statements from California school districts attached as Appendix F; and Council of Chief State School Officers, Education and Instruction through Telecommunications (1995), attached as Appendix G.

country share the benefits.

The Snowe-Rockefeller Amendment, embodied in new Section 254(h) of the Communications Act added by the 1996 Act, recognizes these deficiencies by expanding the concept of universal service to include access to advanced telecommunications services for schools and libraries. In the floor debate prior to passage of the 1996 Act, Senator Snowe said:

Central to the concept of universal service is access for public institutions, which provide services to a broad segment of our population. We must ensure that key institutions in our society -- schools, libraries, and rural hospitals -- are also assured affordable access to telecommunications services. . . . If we want young people to actively use the technology of the future so it becomes second nature to them, then we must ensure that schools are part of the national information infrastructure.⁸

D. School- and Library-Based Networks Offer New and Enhanced Roles for Those Institutions as Learning Centers in Their Communities.

The 1996 Act offers a mechanism for schools and libraries to strengthen their roles in their communities, by serving as access points to provide all citizens with affordable access to information.

First, access to the Internet through schools and libraries -- or other access points such as community colleges and community centers -- can become a cost-effective way for the country to expand subscribership to all Americans, including those who cannot afford the proper equipment. Second, schools and libraries can become community hubs for those who do have the proper equipment. Parents can communicate better with teachers, and other residents can get quick,

⁸ Cong. Rec. S708 (Feb. 1, 1996).

easy access to information about community events and local issues through community networks and local bulletin boards. Third, schools and libraries can address the peculiar problems of rural areas. K-12 schools, libraries, teachers, parents, and other citizens in these areas have to pay substantially more than their urban counterparts to reach on-line information services and the Internet. A school or library in Java, South Dakota, or Rochester, Vermont, for example, could become the access point for the entire community to reach on-line information without paying prohibitive long distance toll charges.

III. THE LAW REQUIRES "UNIVERSAL SERVICE."

A. Core Services Must Be Available to All -- Including Schools and Libraries -- at "Just, Reasonable and Affordable" Rates.

Subsection 254(b) of the 96 Act defines the Universal Service "Principles" to be applied by the Commission and Joint Board. Principle (1) provides that "quality services should be available at just, reasonable, and affordable rates." Principle (3) provides that "consumers" in rural and high-cost areas should have access to services that are "reasonably comparable" to services provided in urban areas and "at rates that are reasonably comparable to rates charged for similar services in urban areas."⁹

Subsection (c)(1)(C) provides that "Federal universal service support mechanisms" are generally available only for telecommunications services that "have ... been subscribed to by a substantial majority of *residential* consumers...."

⁹ We endorse the principles set forth in the initial comments of the Consumer Federation of America ("CFA"), the American Association of Retired Persons, et al., regarding universal service. Attached as Appendix H is a letter from CFA endorsing these comments, as well.

[emphasis added]. But subsection (c)(1)(C) does not say that only residential consumers may receive the benefit of those support mechanisms, and Principle (3) plainly refers to all consumers in rural and high cost areas, as well as low-income consumers. NPRM at ¶¶ 71, 82. In other words, schools and libraries, as consumers of telecommunications services, are entitled to a reduced rate for those services that the Commission decides to include within the definition of universal service. Some would recommend free core services for schools and libraries and this recommendation deserves further study.

B. The 1996 Act Requires Provision of Additional "Special Services" to Schools and Libraries at Discounted Rates to Assure "Affordable" Access and Use.

Special services must be provided to schools and libraries at affordable rates. Principle (6) provides that libraries and schools, including classrooms, "should have access to advanced telecommunications services as described in subsection (h)." Subsection (c)(3) authorizes the Commission to "designate *additional* services for such support mechanisms ... for the purposes of subsection (h)." [emphasis added]. The legislative history indicates that under subsection (c)(3) the Commission is to define universal service more expansively ("different" and "separately") for schools, libraries, and health care facilities.¹⁰

Subsection (h) provides for preferential and affordable rates to schools and libraries. See Conf. Rpt. at 133. Subsection (h)(1)(B) refers to a request for "any of

¹⁰ See Conf. Rpt. at 131, 133. Despite the conference report's use of the phrase "public institutional telecommunications users," subsection (h)(5) (Definitions) clearly includes private schools.

[a carrier's] services that are within the definition of universal service" Thus, subsection (h)(1)(B) requires carriers to provide "special services" designated under subsection (c)(3), to educational providers and libraries at affordable prices. See NPRM at ¶¶ 71 and 82.

IV. THE COMMISSION SHOULD DEFINE "SPECIAL SERVICES" TO ENSURE AFFORDABLE CLASSROOM AND LIBRARY ACCESS TO MODERN TELECOMMUNICATIONS.

The Commission has broad discretion in defining "special services" under §§ 254(c)(3) and (h). Section 254(c)(3) states that the Commission "may designate additional services for such support mechanisms for schools, libraries . . . for the purpose of subsection (h)." The Conference Report states that the purpose of subsection (h) is "to ensure that . . . elementary and secondary school classrooms, and libraries have affordable access to modern telecommunications services that will enable them to provide . . . educational services to all parts of the Nation." Conf. Rpt. at 132. To meet this broad purpose, the Commission should define special services to include all the services necessary to ensure that schools and libraries have the ability to take advantage of all the benefits of advanced telecommunications for educational purposes.

Expanding the reach of advanced telecommunications into the schools and libraries is in the interest of the computer and telecommunications industries because it expands their current and potential markets. It is also in the interest of business in general because increased technical skills will mean a better-prepared workforce.

A. Special Services Should Include All Telecommunications Services Up to and Including Those Available Today at the More Advanced Schools and Libraries.

Some schools and libraries have already installed advanced telecommunications networks. There will always be innovators who move ahead of the pack -- but their current efforts set the norm for tomorrow. As the innovators leave a technology behind, the majority adopts the old cutting edge as the standard. The Commission should take this phenomenon into account in defining special services. By the time the Commission adopts a standard and educational institutions have begun to implement the standard, the leaders will have moved on to something else. By adopting the current standard available at the more advanced institutions, however, the Commission will ensure that the definition of special services is not outmoded before it has even been implemented. This is important because demand for bandwidth tends to increase as users learn to depend on the technology. See Lyndes Decl.

If a service is available now in the more advanced schools and libraries, it must be incorporated into the special service standard to ensure that adequate educational services are available to all parts of the Nation. If the Commission adopts anything less, it will be establishing a standard that will deny most schools and libraries affordable access to services that will shortly be the de facto standard for those with the resources to implement it. Otherwise, most schools and libraries will always be two steps behind, and the central purpose of the legislation will not be achieved. Moreover, if a service is commercially available in an area, there should be a

presumption that the service should also be available to schools and libraries as a special service.

Therefore, the Commission should define special services to include, at a minimum, local and long distance transmission services to provide two-way voice and data communication throughout the world, access to information services throughout the world, and additional services covered by Section 254(h). Such "covered services" include (i) unbundled broadband switching and transmission capacity capable of delivering high quality video; and (ii) classroom and library access, including high-speed, broadband circuits to the building and internal networks to all classrooms, offices, libraries, and computer work stations. These capabilities are all in line with the goals of both the Congress and the executive branch.¹¹

The most prominent and recent discussion of the telecommunications needs of schools and libraries is the KickStart Report. The KickStart Report discusses four models for connecting schools. The "Lab Model" would provide a school access to advanced telecommunications only at the computer lab or multimedia room level. The second, the "Lab Plus" model, would put one computer into each classroom and connect each classroom with a local area network, in addition to the capacity located in the computer lab. The third model, the "Partial Classroom" model, would link half the classrooms in a school with a LAN, and put five computers in each of those rooms. The school would have a T-1 or equivalent external connection. The final or

¹¹ See e.g., National Coordinating Committee on Technology in Education and Training, Executive Summary, The National Information Infrastructure: Requirements for Education and Training (1994), attached as Appendix I.

"Classroom" model is the same as the Partial Classroom model, except that all classrooms would have five computers, all of which would be connected to the LAN.

The KickStart Report also proposes a model for libraries that is the equivalent of the "Lab" model for schools, except that libraries in larger communities are presumed to have access to T-1 lines, and those in smaller communities are presumed to have access to ISDN or standard telephone service.

The covered services proposed above are similar to those included in the "Partial Classroom" and "Classroom" models, with three exceptions. First, the two KickStart models include computer hardware and other terminal equipment, which we have not included in our proposed definition of special services. Second, those models also call for provision of content, professional development and systems operations support, much of which we envision will be provided in conjunction with computer hardware contracts or through other mechanisms. And third, rather than including a T-1 line or its functional equivalent, special services should be defined as encompassing true broadband capability.¹²

Examples of current state-of-the-art functionalities already being used in some schools -- which support the proposed definition of special services set forth above -- are attached as Appendix K. These examples demonstrate that some schools are already using higher bandwidth connections than any of the KickStart models call for. In all cases, however, the 1996 Act requires institutions in all parts of the country to have access to reasonably comparable service if they desire it. Thus, in the case of

¹² See Appendix J for a discussion of implementation costs.

libraries, the KickStart Report's transmission line standards are unacceptable because they assume lower capacity in smaller communities, which may not be adequate in many instances. In the case of schools, limiting the majority to a T-1 line is also unacceptable when some schools are already using OC-3 connections. In addition, about half of schools currently have LAN's for administrative use, and of these about 10% use the LAN to connect computers in all classrooms. These facts alone justify adoption of a standard that calls for internal networks connecting all classrooms and offices and providing broadband external connections.

We wish to emphasize that schools and libraries do not need particular technologies or technical solutions. What they need is the ability to perform certain functions; the best approach will depend on what is practical and cost-effective in a given situation. For this reason, the Commission should include a full range of service options up to and including the highest level described above.

Providing a range of options is also important to impose economic discipline on users. For example, if the Commission were to set a single standard of service, schools and libraries would tend to choose that standard even if it exceeded their actual current needs. But if an institution had the choice of a standard 56 Kbps line, 56 Kbps ISDN service, a T-1 line, or an OC-3 connection, all at different rates, it would be more likely to choose the facility that met its needs because it could use the money saved for some other purpose. Indeed, because we would specifically exclude terminal equipment from the definition of special services, such savings might well go towards purchasing hardware.

Finally, the Commission must ensure that the requirements of special needs populations are also met by the definition of special services. The foregoing definition is broad enough to accommodate the requirements of such technologies as TTY and TDD, but the Commission should consider whether the terminal equipment and services associated with those and successor technologies should be incorporated into the definition of special services.

B. The Definition of Special Services Should Evolve over Time and Should Be Technologically Neutral.

Section 254(c)(1) defines universal service as an evolving level of service, and the definition of special services should also evolve over time. Otherwise, schools will again find themselves unable to provide students with the level of technology training they require. As noted above, the cutting edge will continue to advance, and the de facto standard will advance with it, although always somewhat behind. Thus, the Commission and the Joint Board must periodically reexamine the standard as telecommunications technology evolves. We propose that the standard be reviewed and, if necessary, revised, every four years.

In addition, the Commission should not impose particular technological solutions. As telecommunications technology advances and competition develops among telecommunications providers, different approaches and opportunities will arise. Libraries and schools are primarily concerned with the ability to meet the needs of patrons, students, teachers and other stakeholders, not with favoring particular technologies. It makes no difference to an educational institution whether its traffic is carried by a cable operator or a wireless carrier, so long as it can perform its

mission. Schools and libraries are also aware of the need for any solution to be economically feasible, and such factors as geographic location obviously will affect what technological solution is the most cost effective. Consequently, the definition of special services should emphasize capabilities or functionalities, rather than technology-specific solutions, such as ISDN service or T-1 service.

C. Introducing Advanced Technology Nation-Wide Will Be a Gradual Process.

A broad definition of special services will encourage the gradual development of advanced telecommunications in schools and libraries. There will not be a rush to spend as much money as possible, for three reasons. First, not all schools and libraries may need or want all covered services, or the highest level of those they do want. Creating incentives for economically rational behavior, as discussed above, will hold costs down. Second, many will not be able to take advantage of the provisions of the 1996 Act until they address other infrastructure deficiencies.¹³ Third, schools and libraries will have to find funding for hardware not included in the definition of special services before they can take advantage of most special services.

Thus, although adopting a broad definition of special services will aid library and school networks, it will do so at no risk to the solvency of the universal service fund.

¹³ For instance, many schools will have to upgrade electrical wiring and air conditioning just to run any new telecommunications and computer equipment. GAO Report at 12-13. As much as \$112 billion may be needed to repair facilities to meet all applicable health and safety regulations and allow for the full use of the new technology. *Id.* at 1. These costs would not be funded out of the universal service fund.

V. THE PROPOSED PRICING MECHANISM FOR "SPECIAL SERVICES."

The 1996 Act does not specify how the rate for special services is to be calculated. The legislative history gives the Commission considerable flexibility in this regard.¹⁴ We propose a method that is based on the competitive market price or a surrogate for the competitive market price for each service (if no such price is readily ascertainable), and then provides for a discount from the competitive market price to a level that will ensure affordability to the large majority of schools and libraries. We further propose to allow the carrier, at such time as sufficient data is available, to establish a floor for the rate for a particular service at the Total Service Long-Run Incremental Cost (TSLRIC) of providing that service. Finally, to ensure that the goals of the legislation are met, we also propose an additional lifeline subsidy to schools and libraries in very poor areas.

A. The Rate for Special Services Should Be Based on a Market Rate.

The price of special services should follow this general rule: The price paid by a school or library should not exceed the least of (i) the carrier's present-day rate or current bid, (ii) the lowest price "charged for similar services to other parties," or (iii) a market-based price, discounted to assure affordability.

The general rule ensures that service providers cannot use the benchmark rate as an excuse to raise rates if they are already offering or have negotiated lower rates.

¹⁴ Incremental cost was the only standard reported by the Senate Committee. When the term "discount" was introduced, Senator Snowe explained that the change was intended to offer more flexibility to ensure affordability. 141 Cong. Rec. S 7984 (June 1995) (daily ed.).